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CONCERNING MENTAL DISCIPLINE AND EDUCATIONAL REFORM

DOUBTLESS the stimulating papers of President Eliot, Dr. Flexner and Professor Shorey in *The Atlantic Monthly* (March, April, June, July, 1917) and the related discussions of Professor Nutting in this journal (March 3; September 1) severally found a reception corresponding in the main with the academic and professional affiliations of their readers. In addressing one's self to a brief discussion of but one of the many delicate issues there reviewed it may be well, therefore, at once to declare one's self as associated with the "new pedagogical science" whose representatives are alluded to in one of these papers with all the respect that rightly attaches to high authority, in another as the arch-exponents of the latest type of academic villainy, that, namely, of pseudo-science—a composite characterization, by the way, of one's place in the general scheme of things that leaves something to be desired. One could envy the old woman who had eggs to sell, the possession of her discerning companion.

In his second installment Professor Shorey adds a brilliant chapter to the now elaborated critical literature on the total depravity of "professors of pedagogy." If to know thyself is a first necessity these professors have been infinitely and peculiarly blessed, for indulgent colleagues have spared no efforts to encourage the fullest self-scrutiny, and if they still have the hardihood to look their fellows in the eye, it would almost seem to argue "the insensibility to their own insensibility" of which Professor Shorey speaks so certainly. It would be strange, indeed, if a quarter of a century of inclemencies had not at last induced a corresponding acclimatization, but it is more probable that the pseudo-scientists have not wholly failed to profit by their unusual opportunities for self-knowledge, and have arrived at the philosophy of the town eccentric who publicly took to high boots and a gingham sunbonnet with the explanation that he had made the discovery that everybody was some kind of a qualified fool and that he had decided to be his own kind without apology. One's business with one's situation is to make the best of it, and if the impression is abroad that the group in question are "haters of culture" and of all the graces of civilization, Professor Sherey's sympathizers should understand that the immediate task they find at hand is neither *primarily* humanistic, nor scientific, nor even pseudo-scientific; it is the fitting *humanitarian* task of getting *something somehow* out of the colossal and ineffective machine of public education of benefit to individual youth whose concrete interests they are in a position better to understand than are those who view these things from the academic high places. If their viewpoint is a partial one and if their efforts offend the sensibilities of accomplished humanists and scientists, the one condition is but human and indeed inevitable, the other no one need glory in. In any case Professor Shorey's threat of chastisement in the judgment of the future does not frighten, for contemporary assurances of unequivocal benefits are not lacking and time will enlighten as well as punish.

In the course of his paper Professor Shorey charges the "pedagogical psycholo-

gists'' as a group with having misled the public as to the real teachings of science regarding mental discipline. This charge must be responsible for the present effort to set one's self straight, not only with the issue itself, but with that part of ''the public'' under whose eye the result may fall. The method has been the simple one setting down seriatim certain of the more conspicuous expressions that have grown up in connection with the discussion and to submit them to a private ''adjudication of common-sense, observation and relevant argument.''

1. *Faculty Psychology.*—This expression offers little difficulty and may safely be set aside as representing an obsolete issue. It has reference to a conception of mind in which a limited number of psychical potentialities or capacities (reasoning, will, imagination, etc.) were thought to have a somewhat independent existence, independent of one another and independent of any particular content or material through which or upon which they might work. While no reputable psychologist longer gives adherence to so crude a description, undoubtedly, as Professor Shorey asserts, ''common-sense'' continues to discuss education in terms of faculties. Common-sense, however, here as elsewhere, can not be depended upon for more than common-sense conclusions. We are interested in *adequate* descriptions of the phenomena with which we deal and it is manifestly absurd to talk about training or discipline at all without clear conceptions of what is being trained or disciplined. A reference to faculty psychology is a ''red herring across the trail'' of pertinent educational discussion only on the assumption that its implications are no longer employed in practical educational thinking, and it will appear below that these very implications are the source of misunderstanding in the group of papers now being alluded to.

2. *Formal Discipline.*—The word formal obviously suggests forms of mind as distinguished from material or content and thus rests solidly upon the conception of faculties. These being assumed the essential educational task consisted in training these forms or capacities for effective use in any direction. The issue must therefore be associated with its obsolete presupposition, a conclusion that has been amply demonstrated. As common-sense still makes use of faculties, so naturally it employs a corresponding terminology with reference to training, and it is the common-sense way of justifying studies and educational programs that urgently requires correction in the light of authenticated fact and principle.

3. *The Formal Disciplinary Value of Certain Studies* (the classics, mathematics, science, etc.).—It was wholly natural to assume that a given study had peculiar serviceability to the end of formal discipline, since conceivably it could characteristically train some faculty or faculties more advantageously than other studies could. Being corollary to the foregoing discredited doctrines, this type of discussion falls with them.

4. *The Spread of Special Training* (*the Transfer of Training Effects*).—It has been justly urged that the question of transferability is not the question of formal discipline. The distinction is of the utmost practical importance. That it is a fair one is manifest, for one thing, in that the transfer of training effects involves no presumption of an antithesis of form and content. All aspects of experience therefore come before the bar of possible educational usefulness without any question-begging characterization of either peculiar benefit or irrelevance. The real issue here is clear, if difficult. It is that of discovering, by any proper means, what *relative* importance to the character and life of individu-

ally circumstanced persons the manifold qualities of mind and experience have. A more practical justification of the distinction lies in the fact that the existence of transferability carries nothing in itself as to the amount or significance of the transferred effects *in any concrete situation*. The *amount* of transfer in any case is a matter of experimentation and is known to vary with situations and qualities. The *significance* of the transfer of effects is as great as—and no greater than—the importance of the transferred qualities in the economy of life. Criminal qualities are probably often widely spread upon the personality. The generalized effect clearly supplies no compensation for its unsocial nature. The significance of transferred effects is again a matter for investigation and can not be presupposed.

It is in connection with the last two points that misunderstandings have arisen. The investigations of some educational psychologists have hurried them into the broadest characterization of mental constitution and the faculty psychology has been opposed with a doctrine of mental atomism. Other students have bestirred themselves to prove the falsity of the latter view. The debate in its extreme form has been a reproach to educational psychology—unless debate is always preferable to stagnation of opinion—and has been keenly relished by unsympathetic critics who have felt that their interests were sharply involved.

A still more important outcome has been a real confusion of the essential issues. For instance, Mr. Flexner's argument in its negative aspect was leveled at the doctrine of formal discipline, for which little if anything can be said. He has been met by both Professor Shorey and Professor Nutting by an allusion to the uncertainty of "expert" opinion as to the spread of special training. In consequence, formal discipline and mental discipline have been identified by these writers, who charge Mr. Flexner with a repudiation of all mental discipline. Now it is evident that Mr. Flexner believes in mental discipline, as he ought, for it is obvious that just in so far as the effect of special training is in any measure spread and transferred, the use of the word discipline is warranted whenever the effect is sufficient in amount and worth to be accounted a part of the value of the special exercise or study. But general discipline is not in question, for the transferred effect may be very definitely circumscribed as measured against the entire experience of the person; neither is "formal" discipline involved in the historical sense that some virtue attaches to the training of something other than an integral element of mental behavior whose essential merit must be shown and not taken for granted. As Mr. Flexner well epitomizes "You train what you train."

Perhaps Mr. Flexner is wise, however, in avoiding the word discipline in view of its varied connotations: ". . . education by content," he writes, "does not deny that there is such a thing as training. Indeed, having chosen a particular subject or content, it insists that this content should be so presented as to develop the maximum power and interest . . . it would not bother with discipline in the abstract; but it would endeavor so to do its work that habits and attitudes of the right kind would tend to become the ways in which the individual expressed himself." It is quite possible that there is advantage in the use of "training" rather than "discipline" here, but if "habits and attitudes of the right kind" are asserted to be an important objective in the use of any study or exercise, it is tolerably clear that the one so asserting is liable to the charge of stretching the meaning of "education by content" (or of emptying it of meaning since there is no education save *by* content) and of be-

ing distinctly interested in discipline by whatever name it is called. As an instrument of destruction for the word formal, "content" has the additional disadvantage of implying it.

The essential intention of Mr. Flexner's argument is unmistakable in spite of these matters of terminology in which his critics have become entangled. This seems to be that studies should be chosen for the values they are *known* to possess and not for hypothetical ones, and that the best criterion of indubitable usefulness of these values is their embodiment in subject-matter whose relevancy to the ordinary conduct of life is direct and obvious. The one difficulty with this criterion is that it may lead some to suppose that the mere presence of a subject-mater, such as physical science, carries with it all the good values that may but do not always accompany it. As long as there are great disparities in the effectiveness of instruction there will be warrant for favoring those so taught as to result in "habits and attitudes of the right kind," *other things equal*—if they ever are. This admits the possibility of favoring studies for their "disciplinary" values when these values are generally admitted and not merely alleged. But the moral here is not to turn away from physical science *as a study* to Greek or typewriting, but to insure the effective use of physical science.

It should not be assumed that disciplinary considerations are not in daily employment. In assisting in the choice of subject-matter within a given field, say history or literature, probably the content educationist hesitates as little as the disciplinarian to advise his student friends in high school and college to work with certain men and in certain courses because of an admitted superiority in the training. A course in Browning is perhaps not seldom selected, not so much for Browning's sake as for the discipline in taste and literary judgment known to accompany it. Like discriminations are doubtless often made as between two natural sciences or even quite unlike subjects, for the same good reason.

What can be the force of the admonition urged by excellent authority that we teach "science as method rather than science as subject-matter" unless habits and attitudes of the right kind are more important than mere knowledge or "content." The disciplinary implication here can scarcely be avoided. The reason for immunity in this case from attack on the part of the opponents of discipline is doubtless due less to the disciplinary implication than to the fact that the habits and attitudes in question have all the prestige that associates with modern science and are regarded as tangible and not fictitious things. A like admonition would be in point equally with mathematics or the classics, or any study, if the values alleged for them were equally respected and equally demonstrable. The question is thus not one of discipline as such but of discipline of an authenticated and vitally serviceable kind.

As for the issues raised by Mr. Flexner other than that of the actuality of disciplinary values and a fitting designation for them: the suitability of admitted values in studies for average youth in the schools, and the related one of the possibility of attaining them under limitations set by physiological immaturity and ordinary endowment, the one is a matter of taste and expediency, the other a question of fact. In view of the reconstruction that all admit lies ahead of the public-school institution, it would seem that nothing, but good can come from the fullest possible discussion of these matters, and it is very doubtful if rhetoric and the calling of names is a worthy alternative for honest doubts,

judicious inquiry and even reasonable experimentation. It is quite possible that the reformist is right and that "Il Penseroso," in spite of its virtue as a classic, really does not vitally touch the minds and hearts of high-school youth. An appeal to fact is the one sure way of settling such points. Meanwhile, alternative suggestions are not absurd merely because no one doubts the very great desirability of an appreciation of classic literature for those who can appreciate it.

The confusion of formal discipline with mental discipline is evidently responsible also for the contention of Professor Nutting that because a definite conclusion has not been reached regarding the spread of special training, *therefore* "the burden of proof rests upon those who would overturn the existing order of things." "When their case is proved," he remarks, "it will be time enough to begin the work of reconstruction." Now in so far as the existing order of things rests upon those implications of the doctrine of formal discipline which account historically for much of its present constitution, the case *is* proved and reconstruction might go gaily on. But the data upon which a reasonable conception of *mental discipline* rests are not such as yet to warrant reconstruction with respect to this issue alone. This has been noted by Professor Shorey in these sentences:

> To the practical purpose of estimating the disciplinary value of high-school and collegiate studies, this kind of science has nothing to contribute. The essential consideration is obviously the number of elements which the compared processes have in common—the elements, that is to say, which the entire educational process involved in the linguistic analyses of Latin grammar, the mastery of Latin vocabulary, the critical translation and appreciation of Latin writers has in common with the other desirable kinds of knowledge or forms of mental activity and faculty.
>
> In other words, science leaves this question where it was—to the adjudication of common-sense, observation and relative argument on the specific facts by those who know the facts well enough to discuss them intelligently.

The second paragraph has been added in order to quarrel with it. The statement clearly indicates where science has left this question, but this is hardly where science found it. Science has demolished for good certain false supports upon which not only Latin, but other studies, rested in traditional curricula and has placed others under suspicion, so that the adjudication of the future must involve systematic "observation" far more than has that of the past. But the truth of the first paragraph can scarcely be brought into question. It is, however, not complete. A clear demonstration of a significant spread of training from the composite set of activities referred to as the study of Latin would of itself not serve as sufficient warrant for the selection of Latin on the ground of its disciplinary value. This could only be justified when it had been further established that this spread of training was greater in amount and more significant in kind than that of the compared "forms of mental activity and faculty" with equal claims *on other grounds*. If the claims of other studies on other grounds, such as more immediate serviceability in meeting the urgent necessities of life, were superior to those of Latin they would, conceivably, more than compensate for some real advantage in Latin as a discipline.

In short, it is useless to argue from transferability of training directly to either the retention or the substitution of studies, since their *comparative* disciplinary value is not known. All parties being equally in ignorance, the burden of proof lies with any one who propounds a theory. If one is disposed to retain the classics for their unique disciplinary value he clearly must bear the burden of justifying his attitude. All studies being in equal case in this matter it will be well as

a general rule to take Mr. Flexner's advice and choose studies for values they conspicuously possess, such as, for instance, those the Latin language has over the Greek to one who needs to read the Latin language, or the values that reside in botany to one who wishes to understand plants.

5. *Mental Discipline.*—One concludes, therefore, that this expression is justifiably used to refer to an educational value in any exercise or study when it is effectively employed with a view to training "habits and attitudes of the right kind." Such habits and attitudes can not be presupposed or derived from some hypothetical view of mental constitution, but must actually be known with reference both to the amplitude of their effect and the quality of their contribution to a good life. There remains the additional necessity of making wise choices among all possible habits and attitudes of the right kind with respect to individual gift and circumstance. One who still objects to the traditional flavor of the expression may well use a substitute without conveying the impression that it no longer represents an actuality.

6. *Mental Gymnastics.*—This expression could be justified perhaps in the same terms except for the suggestion of the physical analogy of exercises devised expressly for the single purpose of inducing habits and attitudes of the right kind. Since no one seriously believes in educative exercises or studies for such a purpose alone, the expression has little practical usefulness in the mental sphere.

7. *Specific Education.*—The opponents of disciplinary education are in real danger of overdoing matters by an insistence upon such expressions as this, which are altogether too suggestive of an atomistic psychology whose standing is little, if any, better than that of the antiquated faculties. In spite of the constant reiteration of statements to the effect that "there is a different memory for everything we remember, a different reason for everything we reason about," etc., the teachings of psychology to-day do not authorize them. There are probably very few, if any, activities in school or elsewhere that are strictly "specific" and particular. The spread of training *in some degree* is apparently almost a universal fact, which means that any activity under training has some elements in common with others and is to be regarded by so much as a habit or attitude with a possible usefulness beyond its immediate particular setting. As a matter of fact "specific" and "general" are relative terms in this connection. Every activity is at once specific and general, specific in its identification with what is unique in the given situation, general with reference to what is common with other situations. The one altogether important matter is that it should be known in any given instance how much the activity is one or the other, and that educational effort should be governed accordingly. The one error is to deceive one's self by unwarranted presuppositions of some hypothetical or unreal "specific" or "general" emphasis. The reason why the debate on this issue continues with such little profit is that one party or the other insists upon generalizing on the basis of one extreme to the disparagement of the element of truth in the opposite position, and upon elevating its interpretation into a doctrine of universal application.

There is little difficulty in compromising the two extreme positions *as doctrines.* In comparison with the presuppositions of a faculty psychology, the mind has been shown by experimental study to be *astonishingly "specific"* in make-up and behavior, so much so that one realizes the degree of it, especially with young and low-grade minds, with the utmost difficulty.

On the other hand, the distinguishing feature of adult human mental constitution as compared with animal, for instance, consists in an *astonishing capacity for generalizing* its behavior in the form of attitudes and ideas. Human education is, therefore, bound to be governed by both facts. If it is to be real and not fictitious it must take account of a specific characteristic that for centuries was almost wholly unappreciated. But for distinctive human quality and efficiency it must in aim and purpose be everlastingly "generalizing."

The educational implications are obvious. You train what you train. Therefore if possible find out what it is. Educational *aim* is another matter. If trade and lower forms of industrial education are in question, or spelling, or the combinations of numbers, specific effects are probably what is needed. If secondary or higher, technical, and, more especially, liberal education is in question, then every potentiality favoring the generalizing of habits and attitudes of the right kind should be exploited to the limit of pedagogical resourcefulness. Liberal education is by definition nothing so much as a deliberate practise aimed at good *habits* of taste, sentiment and character. One might in this connection risk a statement that has given special offense to the adherents of specific and content education: "It matters little what you study so long as you study it right," the point being that in liberal studies so much depends upon the teacher and his methods and personality that "discipline" might conceivably be emphatically the important matter.

8. *General Discipline.*—If the spread of training is never universal but always more or less circumscribed, the qualifying term here can not be employed with an unlimited meaning. Unhappily no one is longer able justly to maintain that any exercise or study is capable of inducing or even encouraging all habits and attitudes of the right kind. It's a pity that it is so, for education becomes immensely complicated by the fact. The values of a study are at once partial in quality and defined in their range. Each makes a contribution that needs to be known in both directions. Each has generalizing possibilities, doubtless, that require fullest exploitation in behalf of the highest development of power. Almost everything depends upon the way in which the study is used.

But "general discipline" is used also to refer not so much to the effects of single studies as to the composite effect of all studies composing a program or curriculum. We are assured by Professor Nutting that "the advocate of a disciplinary theory of education will readily admit that the study of Latin does not bear very specifically upon the problem of learning algebra. This is not the real point at issue. The important thing is that these two very different exercises supplement one another in helping to round out an educational scheme designed to furnish *general* mental discipline through a combination of courses that experience has approved"—a construction of the expression, by the way, that looks suspiciously like "specific" education in sheep's clothing. If experience has approved the traditional combination of studies of which Latin and algebra are such conspicuous elements, one wonders what all the pother is about and why the reformist is given a hearing at all and permitted the use of large sums of money for his experimentation. And if the approval of experience is lacking for any such combination of studies it avails little to invoke a "general" discipline which derives from the cumulative effect of studies whose several disciplinary contributions are only surmised and even assumed. This way out gets nowhere. There is no escape from the labor of inductive study of the values that

are alleged to lie in studies. Some no one questions. Others are disputed even within the ranks of those "who know the facts well enough to discuss them intelligently." The latter must be brought to the test recommended by Professor Shorey, the "adjudication of common-sense, observation and relative argument," especially observation. Polemics and presupposition are quite as inappropriate in the exponents of special studies as they are in the "new scholastics."

9. *Interest versus Will.*—While this antithesis has been pretty well resolved by those who have taken the trouble to go through the discussion bearing upon it, erroneous extremes and incorrect conceptions remain in one form or another to complicate the question of mental discipline. The indulgence of whim and the use of sugar-coating methods of instruction may be depended upon to spread their unwholesome effects into habits and attitudes of the wrong kind. This is in fact the objection that has been urged by all parties against "soft pedagogy." Arbitrary insistence upon a false "application" without genuine motivation doubtless leads to a corresponding result. Studies conducted with due regard to the necessity of vital purpose will lead to the habits and attitudes of determination and strength of intellectual effort that all parties admire. Studies as such have little to do with the matter. All depends upon the way they are approached and conducted. "Discipline" is involved in any case, since habits and attitudes of *some* kind are encouraged. The real alternatives are those of kinds of discipline.

10. *The Values of the Classics, Mathematics, Etc.*—It becomes quite evident that the question of mental discipline has no greater relevance to the discussion of the values of certain studies than it has to any, in the present state of knowledge of these matters. The disciplinary values of any study are what they are. Let their informed exponents demonstrate what they are and so place them beyond cavil. The pseudo-scientists will be glad to be relieved of the task. Their "fierce resentment of what they deem the supercilious arrogance of those who possess or strive for some far-off touch or faint tincture of the culture and discipline which they denounce as shibboleths, taboos and the arbitrary conventions of pedants" will at least be rendered voiceless. They may, haply, thus be rescued from some part of their barbarism.

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A GLIMPSE AT EARLY COLONIAL ALGEBRA

IN many of our libraries in the east and in collections of Americana it is not unusual to find notebooks of students of the colonial period which set forth in the careful script of the time the work accomplished in arithmetic under itinerant schoolmasters or in the academies of New England. To find a notebook in geometry is not so easy, for Euclid, although a recognized author, or rather a recognized subject, was taught only in the few colleges that had been founded here and there, and the number of notebooks like the number of students must have been relatively small. As to algebra, notebooks in this science are so rare that one seldom finds them even in large collections of colonial material, and hence it becomes a matter of interest to those concerned with the history of education and of early American mathematics when one is discovered.

It happens by a coincidence of circumstances that there now exists in the museum housed in the old jail in York Village, Maine, a manuscript on algebra by Samuel Langdon, sometime president of Harvard College, written under the direction of

Isaac Greenwood, for several years professor of mathematics and natural philosophy in the same institution. The manuscript was found some years ago in the old Sewell mansion in the village, known as Coventry Hall, one of the finest pieces of colonial architecture in this section of the country. The Langdons and Sewells had intermarried and this manuscript had been handed down in the maternal line until it found place in the Sewell library. Such a rarity deserves more than passing mention, and educational interests make it proper that some record of its contents and of the circumstances of its preparation should be made.

It consists of seventy-five numbered pages, with two unnumbered pages forming a front cover and eighteen unnumbered pages at the end, the latter being blank except for a few unimportant notes on one leaf. The pages are 14.7 cm. by 18.7 cm., and the book consists of forty-eight leaves, three fourths of one leaf having been cut out by the author. On the front cover appears the inscription, "Samuel Langdon's Book, July 25, 1739," and on the reverse of this leaf are the words: "Algebra by Isaac Greenwood, M.A. Began July 25, 1739." A colophon reads: "Finished writing Algebra August 17, 1739. Algebræ Finis," showing that young Langdon was about three weeks in copying the notes of his work under Greenwood.

Before considering the manuscript itself, it is of historical interest to speak of the two men concerned in its production. Isaac Greenwood was born in Boston in 1702, was graduated at Harvard in 1721, and in 1727 was called by his alma mater to the newly-created Hollis professorship of mathematics and natural philosophy, the second man in America to occupy such a chair. Two years later he published anonymously a work on arithmetic, the first to appear in the New World at the hand of a native American. He resigned his professorship July 13, 1738, a year before this manuscript was copied, having been "guilty of many acts of gross intemperance, to the dishonor of God and the great hurt and reproach of the society." Whether Langdon took the work before the summer of 1738, copying the notes in the summer of 1739, or took work with Greenwood after the latter's resignation of his chair, does not appear, and indeed is a matter of little importance. At any rate, Greenwood was only about thirty-six or thirty-seven years old when he aroused the interest of his promising pupil of fifteen or sixteen in the comparatively neglected science of algebra. He died in 1745, only forty-three years of age, a scholar as measured by his opportunities, an unfortunate victim of his appetites, but nevertheless a promoter of sound education.

Samuel Langdon was born at Boston in 1723. He received the degree of A.B. at Harvard in 1740, at the age of seventeen and a half years. Three years later he received the degree of A.M., in 1745 he was licensed to preach, and as a member of the colonial army he was present at the capture of Louisburg. In 1762 the University of Aberdeen conferred upon him the honorary degree of S.T.D.,[1] and in 1774 he became president of Harvard. The academic crown was far from being an easy one in his day, however, at least for a fighting patriot of the colonies, and in 1780 his resignation was forced by the wealthy loyalists upon whom the college was compelled to depend for a certain amount of its support. He died in 1797 at the age of seventy-four years.

[1] Or possibly D.D., for the tombstone of his wife in the Sewell plot in the York churchyard reads "In memory of Madam Elizabeth Langdon Relict of Rev[d] Samuel Langdon, D.D., who after a long life devoted to acts of charity, benevolence and piety, died Dec[r]. 21st 1802 Aged 85 years."

We see, therefore, that the manuscript now preserved at York Village was written at the close of Langdon's junior year, but that it is a record of work taken under Greenwood probably a year or two earlier. At any rate it represents the algebra taught at Harvard about 1737–38, to a boy of fifteen or sixteen, by one of the first men to hold a special chair of mathematics and natural philosophy in an American college.

The opening paragraph shows the influence of John Wallis,[2] at least indirectly:

This science is called Algebra from two or three Words in y^e^ Arabian Language, which may be interpreted either y^e^ Art of Restitution & Comparison, or y^e^ Art of Resolution & equation. It is also known by various other names. The first y^t^ wrote on this Subject in Europe, termed it y^e^ Rule of Restitution & opposition. Since, it has been called by some, y^e^ Analytick Art; by others Specious Arithmetick, Regula rei et Censûs, y^e^ great art, modern Geometry, universal mathematicks &c.

The topics treated, expressed in the words and form of the manuscript, are as follows:

Notation, Algebraical Characters, Addition of Integers, Substraction,[3] Multiplication of Algebraick Integers, Division, Algebraick Fractions, Addition & Substraction of Fractions, Multiplication of Fractions, Division of Fractions, Involution of whole Quantities, Fractional Involution, Evolution of whole Quantities, Fractional Evolution, Binomial Quantities, Involution,[4] Involution of Binomial Fractional Quantities, Multinomial Quantities, Involution,[5] Fractional Compound Quantities, Evolution of Multinomial Quantities, Surd Quantities, Notation,[6] Reduction of Surds, Multiplication of Surds, Division of Surds, Addition and Substraction of Surds,[7] Compound Surds, Æquations, Reduction of Equations, Reduction by Addition, Reduction by Substraction, Reduction by Multiplication, Reduction by Division, Reduction by Involution, Reduction by Evolution, Reduction by Analogies to Equations, & e Contra,[8] The Method of resolving Algebraical Questions, General Rules concerning y^e^ Reduction of Equations, Simple Equations, Mr. Oughtreds[9] method of solving adfected Quadratics, The Solution of adfected Equations by taking away the second term,[10] The Solution of Adfected Quadratic Equations, by y^e^ Method of compleating y^e^ square, Questions producing adfected Quadratick Equations, The Resolution of Cubick Equations, Cubick Equations by Substitution, Cubick Equations by Tryals & depression, The Solution of irregular Cubicks, The method of converging Series and Approximation. I of Simple Roots, II of Adfected Equations, Mr. Ralphson's[11] Theorems, Dr. Halley's[12] method for solving equations of all sorts,[13] Concerning y^e^ method of solving Geometrical Questions Algebraically.[14]

There are various interesting passages in the manuscript, a few of which are as follows:

The letters used by Algebraists are generally small Letters, because y^e^ Capital are generally imployed in Geometrical figures. (Page 2.)

And such quantities as are negative are markt with y^e^ Sign (—); thus $x - u$, & $u - x$ express an Affirmative quantity, as an Estate which may be noted by x, lessened by another quantity u,

[2] Opera, Vol. II., Oxoniæ, MDCXCIII., page 2.

[3] This spelling is used throughout, after the manner of the time. It is found, for example, in Greenwood's arithmetic of 1729.

[4] Of binomials.

[5] Of multinomials.

[6] Of surds.

[7] Properly following the other two operations.

[8] *E. g.*, to reduce the analogy $x : 4 : 2x$ means to write $2x^2 = 16$, whence $x^2 = 8$.

[9] This is William Oughtred (c. 1573–1660). On his treatment of quadratics see Cajori, *William Oughtred*, Chicago, 1916, p. 29.

[10] That is, if $x^2 + dx = m$, put $y - \frac{1}{2}d$ for x, whence $y^2 - yd + \frac{1}{4}d^2 = x^2$ and $y^2 = m + \frac{1}{4}d^2$.

[11] Joseph Raphson, who modified Newton's method of finding the approximate roots of a numerical equation. For a discussion see Cajori, "Oughtred," as cited above, p. 40, Cantor, "Geschichte der Mathematik," III. (1), p. 114.

[12] This is Dr. Edmund Halley, the great astronomer, and the friend and patron of Newton. See Newton, "Arithmetica Universalis," Cantabrigiæ, MDCCVII., p. 327.

[13] Approximate roots of numerical higher equations.

[14] This work shows that a good course in Euclid had preceded the algebra.

which may denote y^e debt thereof, being a negative quantity. (Page 3.)

Mr. Oughtred's method of solving adfected Quadratics . . . Rule Multiply y^e absolute by 4, and add thereto y^e Square of y^e Differential quantity; & y^e Square Root of this,—y^e Differential Quantity, being divided by 2 is y^e quantity sought. (Page 43.)

Among the symbols, the bar is the only sign of aggregation used; ÷ is used for continued proportion;]and[are used for greater than and less than, as in the seventeenth century works; $a \sim b$ is used for the difference between a and b, as is still occasionally done in elementary books; and although the second power of a is indicated by a^2, the more common form is aa, and on occasion there is found $aaaaa$ for a^5, and similarly for other letters. The symbols are mentioned as "first introduced by Vieta," which of course was far from being the case.

[In finding powers of a binomial] if y^e numeral figures or Co-efficients could be found, y^e whole might be performed without multiplication; & this is done by y^e following Rule, given by S^r Isaac Newton. See p. 139.[15] To find y^e Coefficients in Binomial Quantities.—Rule. Multiply y^e Co-efficients into y^e Index, & divide y^e Product by y^e number of Terms, counting from y^e left hand, & y^e Quotient will be y^e Co-efficient, or numerical figure of y^e next successive Quantity. (Page 18.)

Irrational Quantities are noted thus √: 2, which is 2 with y^e Sign of irrationality before it. (Page 22.)

When at any time there is y^e Sign of Irrationality prefixt to mixt numbers, with y^e Line of Separation over them, as $\sqrt[3]{:\ 7 + \sqrt{:\ 2}}$, it is called an universal Root. (Page 22.)

At the end of the manuscript, on the inside of the last cover leaf, the ratio of the circumference of a circle to the diameter is given correctly to thirty-two decimal places, but the symbol π is not used.

The existence of such a manuscript suggests the possibility of finding similar material relating to algebra, geometry, natural philosophy, conics, and even the calculus.

[15] Of what work?

It might well repay a student for his efforts in searching the small as well as the large museums, libraries, and collections of Americana with this single purpose in view.

The little work has also a further suggestion to us in the disturbed condition of our present education, namely, that this boy of fifteen or sixteen, a high-school youth as he would be to-day, was not bothering with hundreds of examples in factoring and in complicated fractions, but was giving his energies to the study of those cubic and numerical higher equations needed in his work in what was known as natural philosophy. Might not a certain part of the objection to our algebra of the present be removed if we gave less attention to various topics of a purely mechanical nature and more to the real applications of the science?

DAVID EUGENE SMITH
TEACHERS COLLEGE,
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EDUCATIONAL EVENTS

TEACHERS AS ELECTION OFFICERS

MR. GEORGE L. RECORD is quoted as suggesting that the conduct of elections by public-school teachers would remove all necessity for hiring watchers at the polls, and therefore all excuse for the raising of money by party candidates or organizations for this purpose. He says:

The objection that the hours are too long for women teachers, and that they would be kept up late in the night counting the votes, can be easily obviated by providing that two or at least three members of the board shall constitute a quorum, and then the teachers could work through the day in relays, which would make the work very easy. In Kansas they count the votes every hour, or as soon as each 100 votes are cast, and we could adopt that system here, or provide that two hours before the close of the polls one half of the board should commence to count the ballots already cast, and in this way all of the returns would be in and the work be concluded by eight or nine o'clock in the evening.

It is my judgment that the teachers would wel-

come this opportunity for rendering service, and in these times of high prices the liberal compensation which each member of the Board of Election Inspectors receives would be welcomed as a much-needed addition to the teachers' present salaries.

The only three plans that I have heard suggested, aside from the existing system of party representatives on election boards, are, first, election boards composed of men drawn by the judges of our courts in the same way as struck juries are drawn; that is to say, boards composed of our best citizens would be virtually drafted and forced to serve; second, that the police and firemen should serve or third that the school teachers should so serve.

The teacher plan appeals to me as the most practicable of all. The school teachers are equipped by their training and experience for the duties of election officers. They are quick, intelligent and familiar with figures and handwriting. They are protected by the Civil Service law, and, therefore, could have no motive other than to secure exact justice.

It is obvious that woman suffrage will be adopted in this state as soon as a constitutional amendment can legally be submitted. When that comes the women will vote like men, and it will be very appropriate that women should serve upon boards of election, as they now do extensively in the state of Colorado and other states where woman suffrage has been in force for some years.

THE SEATTLE SCHOOLS

The objects accomplished by the school board of Seattle are stated by it to be as follows:

I. To furnish convenient, comfortable, sanitary and safe school buildings. The buildings erected for several years past both for elementary and high schools have been of fire-proof construction. Attempt has been made by the board to provide them with the most approved heating and ventilating systems.

II. To afford in the way of equipment and supplies both in quantity and quality all that has appeared to be requisite for carrying on the work of the schools satisfactorily and for maintaining a high standard of excellence.

III. To employ a competent staff of teachers whose qualifications and spirit are of a kind to make instruction most effective and salutary.

IV. To provide such special lectures as will enable different needs to be more clearly satisfied than by ordinary means and methods. Among these special features are:

1. Industrial or prevocational classes for both boys and girls, in which shop work and the operations of the household are given much greater time and attention. These classes have proved very popular, there being now nearly 2,000 grammar-grade pupils enrolled in them.

2. Auxiliary teachers for helping forward those pupils who can make up lost ground or gain additional ground by receiving special help.

3. Medical inspection and the school clinic, through which the physical difficulties of school children are cared for, so they are made better physically and therefore fitter for study and progress in school work.

4. Two parental schools, one for boys and one for girls, by means of which the delinquent are brought under favorable conditions for better citizenship, and the regular schools relieved of an embarrassing charge.

5. Special schools in which subnormal types of children are given instruction and training suited to their capabilities and needs, a thing that can not be done in the ordinary school. At the same time, the regular schools can do their legitimate work much better when not handicapped with misfit pupils.

6. Evening schools for the assistance of either youths or adults who feel the need of schooling of which they have been deprived. More than 4,500 have enrolled in the evening schools this season. Any subject in the day-school course for which there is sufficient demand is taught.

FURTHER FEDERAL GRANTS FOR VOCATIONAL EDUCATION

Federal grants of money for vocational education totalling more than $240,000 have been allotted by the Federal Board for Vocational Education to eight states, it is announced today. Each of these states has complied with the terms of the Smith-Hughes law and has agreed to match every federal dollar with money publicly raised by the state or local community. The states are as follows: Con-

necticut, Idaho, Illinois, New Hampshire, North Dakota, Missouri, Maryland and Vermont.

The payments of federal moneys to the states are made through state boards for vocational education and are divided into three general classes: Money allotted on the basis of rural population for the salaries of teachers, supervisors or directors of agricultural subjects; money allotted on the basis of urban population for the salaries of teachers of trade, home economics and industrial subjects; and money allotted on the basis of total population for the maintenance of teacher-training courses in all subjects.

The approval of the plans of these states brings the total of the states now enjoying the benefits of the Smith-Hughes act up to 47. Rhode Island has not yet accepted the act.

The total amount of federal money available for the use of the states in the promotion of vocational education during the current fiscal year is $1,860,000. State by state, the latest allotments are as follows:

Connecticut	$22,902.76
Idaho	15,000.00
Illinois	93,772.25
New Hampshire	15,000.00
Maryland	21,304.56
North Dakota	15,205.09
Missouri	53,701.27
Vermont	15,000.00

THE REORGANIZATION OF ENGLISH IN THE SECONDARY SCHOOLS

WRITING upon the study of the mother tongue in 1903, the late Professor George R. Carpenter, of Columbia University, remarked that it would not be many years before the whole subject of the teaching of English could be taken up from a broader and more philosophic point of view, the different theories harmonized, the different aims unified, and an ideal course of study, thoroughly adapted to American needs, built up throughout the country.[1] It is perhaps not too much to say that the purpose which Professor Carpenter cherished has been in some degree realized in the recently published report of the National Joint Committee of Thirty on the Reorganization of English in Secondary Schools.[2] This report was compiled with much greater pains than any preceding report of the same character. The work occupied more than five years and involved the activities of several subcommittees which collected data throughout the length and breadth of the country.

The principal sections of the report are devoted to a history of the study of English in American secondary schools, the movement for reorganization, the new point of view and the new aims of the English course, the reorganization of the course into practical and literary aspects, the details of the subject matter in composition and in literature for the seventh to the twelfth grades of the common school, training in oral expression and in business English, general reading, the school library, and problems of administration. A classified and annotated bibliography of 1,500 titles completes the work.

Among the points emphasized in the report are the following: The need of doing the work of the high school as a preparation for life rather than for college; the essentially social character of the activities, both in the study of literature and in the practise of composition; the desirability of distinguishing between the utilitarian aspects of English study and the literary aspects; the value which attaches to the reading of modern books and periodicals, to individual as well as class reading, to the giving of plays and participating in literary societies, to the making of a school paper; the pressing necessity of cutting down the number of pupils to the teacher in the high schools in the large cities; and the making of a definite provision for training teachers in service.

The report, while entering into detail, makes no attempt to fasten a single unvarying procedure upon the schools of the country. It attempts to establish a definite point of view and to place within the reach of the individual principal and teacher suggestions for making this

[1] "The Teaching of English," by Carpenter, Baker and Scott, page 52.

[2] Bulletin No. 2, Series of 1917 of the Bureau of Education, Department of the Interior, Washington, D. C.

point of view effective, but everywhere the report assumes that the work in English must be adapted to local conditions. The fact that the pupils who now attend the public high schools no longer represent a selected group, but come from the homes of all the people, is constantly borne in mind and its implications pointed out. The general trend of the report is away from motiveless and formal activities on the part of the pupils and in the direction of real and vital situations, fitted to call forth the best energies of the pupils.

Several thousand copies of the report have already been carefully distributed by the Bureau of Education, each state having received its quota for the use of principals and teachers in its high schools. A number of educational associations have planned to devote a part of their discussions to the consideration of the suggestions made by the committee. Some cities, and even states, have reorganized their courses of study with the help of these suggestions. There seems no doubt that the report will prove one of the most influential educational documents prepared in recent years.

THE UNIVERSITY OF KENTUCKY SURVEY

THE trustees of the University of Kentucky, in December, 1916, authorized the appointment of a committee of their own number to investigate the proposed consolidation of the colleges of mechanical engineering and civil engineering and "other conditions causing or tending to produce discontent among the alumni and student body and the general public towards the existing administration." The phrase "other conditions" had reference to widespread, though somewhat indefinite, charges of graft, nepotism, and inefficiency on the part of the administration, low standards of scholarship, lax discipline, immorality and irreligion among the faculty, etc.

Governor Stanley, as president of the board of trustees, appointed, in January, 1917, a committee of five members, under the chairmanship of Mr. Robert G. Gordon, an eminent lawyer of Louisville. This committee itself investigated at length the more personal accusations that were current. It also made provision for a survey of educational conditions in the university, employing for this purpose Dr. Kendric C. Babcock, dean of the college of liberal arts and sciences of the University of Illinois, Dr. Thomas F. Kane, president of Olivet College, and Mr. C. M. McConn, registrar of the University of Illinois.

The investigation failed to establish the charges of corruption and immorality that had been made; in most cases it was conclusively shown that these were entirely without foundation. The report of the survey commission, however, revealed serious defects of organization and administration and contained an extensive series of recommendations looking to the bettering of conditions. Practically all of these recommendations were adopted by the committee of trustees and approved by the full board of trustees at its annual meeting in June, 1917.

Among the more important changes thus accomplished or put in the way of accomplishment are:

1. A reduction of the membership of the board from 32 to 15. This requires action by the General Assembly. It involves the resignation of all the members of the present board.

2. The prompt publication and wide distribution of the minutes of the board of trustees.

3. The retirement of President Henry S. Barker, a distinguished lawyer, of high integrity and great personal charm, but no educator, and the selection, by a joint committee of the trustees and the faculty, of a professionally qualified president. The joint committee included four trustees and three faculty representatives, the latter "nominated to the board by the faculty themselves voting by ballot at a meeting called for the purpose." President Frank L. McVey, of the University of North Dakota, has already been elected to succeed President Barker.

4. A provision that all appointments are to be made on the recommendation of the president (rather than on the initiative of the trustees themselves).

5. A "merit rule" for all appointments,

with a clause directed especially against the appointment of relatives.

6. A provision for appeal on all matters:

> Any member of the administrative or teaching staff of the university who has made, in due course . . ., any request or recommendation and has had such request or recommendation disapproved, shall have the right, with due notice given, to a full hearing before the board of trustees or the executive committee, with the privilege of presenting evidence or witnesses and of being present at the subsequent discussion of his case until the vote thereon is to be taken.

7. The recognition of the faculty (professors and assistant professors) as a legislative body on matters of educational policy, and of the council, or executive committee of deans, as an administrative body only, with the distinct provision that it "shall not have legislative functions, *i. e.*, shall not have power to make or amend rules, though it may in its capacity as an administrative body suspend the action of a rule in an individual case."

8. The consolidation of the heretofore separate colleges of mechanical, civil and mining engineering; the nomination of a dean for the new college to rest with the incoming president.

9. The reincorporation of the college of agriculture and experiment station, which although located in Lexington had become practically a separate institution, into full administrative unity with the rest of the university.

Some sixty other recommendations cover various points of educational and financial administration, student discipline and the like.

EDUCATIONAL NOTES AND NEWS

H. H. BAISH, formerly city superintendent of the Altoona public schools, and for several months chief clerk in the United States Department of Education at Washington, has been appointed secretary of the Teachers' Retirement Board of Pennsylvania, provision for which was made by the last legislature.

DEAN LEON CARROLL MARSHALL, of the school of commerce and administration at the University of Chicago, has been appointed chief of the section on industrial service of the Council of National Defense. Mr. Marshall will direct an inquiry regarding the labor supply for industries holding government contracts.

DR. WILLIAM ARNOLD SHANKLIN, president of Wesleyan University, will leave shortly for Red Cross service in France.

MISS ANNE HERVEY STRONG, assistant professor of public health nursing at Simmons College and director of the Simmons Instructive District Nursing Association's Nursing Training School, has been made chairman of the education department of the National Organization for Public Health Nursing, to succeed Miss Katherine Tucker, of Philadelphia, who has resigned.

EDGAR A. DOLL, who has been assistant psychologist in the Training School at Vineland, N. J., has been appointed an instructor in psychology in Princeton, N. J.

DR. GEORGE ROSS WELLS, associate professor of psychology at Oberlin College, has been appointed professor of psychology and head of the department at Ohio Wesleyan University.

MR. ELMER A. HOTCHKISS, of Cleveland, has been appointed head of the training department of the Colorado Teachers' College.

DR. GRETE EGERER, assistant professor of bio-chemistry in Goucher College, has accepted a call to a similar position at the University of Minnesota.

MR. L. S. HONAKER has been elected professor of physical instruction and athletic coach in Baldwin-Wallace College.

MISS MAUDE CLEVELAND, director of the women's gymnasium and assistant professor of physical education in the University of California, has been granted leave of absence for the present academic year to do Red Cross nursing service in France.

PROFESSOR E. DANA DURAND, chief of the division of agricultural research of the University of Minnesota, has resigned in order to devote entire time to his work in the college of science, literature and the arts.

IN honor to Andrew S. Hallidie, inventor of the use of the cable railway for passenger

traffic in cities (he was a regent of the University of California from 1878 to 1900), the regents of the University of California have given the name "Hallidie Building" to a building which they are now erecting in San Francisco as an investment of university endowment funds.

LEVERETT WILSON SPRING, professor emeritus of English literature at Williams College, died on December 23.

ANDREW PAUL RAGGIO, professor of Spanish and Italian languages at the University of Maine, died on December 21 at Orono after a brief illness.

THE Cornell University Faculty on November 14 adopted resolutions on the death of Librarian Emeritus George William Harris, '73. The resolutions review Mr. Harris's forty-two years of service in the library, and conclude:

> He was a master of all the details relating to the acquisition and administration of books, a conscientious steward of funds and a skilful buyer. Not only was he a scrupulous guardian of what was in the library, but he was insistently careful as to what got into it. Many a faculty member will recall his censorship of lists of books submitted for purchase. His way of living and thinking was Spartan-like and his speech laconic—brief, decided, but well considered. He spared no toil in the scrutiny of minutiæ, even his handwriting and every document prepared by him exhibiting that regard for exactitude which made him an exemplar for us all. No one who knew him will forget that stoic figure, without overcoat, in the coldest days of a campus winter energetically crossing to the library. He was a lover of nature and of poetry. To him the library owes the foundation for the purchase of the works of the Victorian poets, a collection which his constant care made noteworthy.

WE learn from the London *Times* of the death of Mr. Frank Ritchie, since 1904 secretary to the Common Entrance Examination for Public Schools. It was largely due to the energy and enterprise of Mr. Ritchie—who three years earlier had been appointed secretary to the Association of Preparatory Schools—that the common entrance examination scheme was instituted. It enables boys to be examined at their preparatory schools for entrance to the public schools, thus saving trouble and expense. The plan has been adopted by most of the public schools, and the organization of the machinery, by no means easy, was due almost entirely to Mr. Ritchie's tact, judgment and ability. Before undertaking this work Mr. Ritchie, who was born in 1847 and educated at Lincoln College, Oxford, held various educational posts, among other things helping to start the new high school for boys at Plymouth.

DR. J. BASS MULLINGER, the historian of the University of Cambridge, died on November 22. He was Birkbeck lecturer on ecclesiastical history at Trinity College, and was a lecturer to the Teachers' Training Syndicate on the history of education. For many years he held a university lectureship in history and was librarian of St. John's College. He was an author of numerous books, the most important of which, and one which will keep his name alive, is his monumental "History of the University of Cambridge down to the Decline of the Platonists." The first volume of this appeared in 1873; the third six years ago.

THE National Society for the Promotion of Industrial Education has changed its meeting place to Philadelphia. The dates, February 21 to 23, 1918, are still retained. This will enable delegates to the meeting of the Department of Superintendence of the National Education Association, in Atlantic City, February 25 to March 2, to attend both meetings. The congested living conditions which have developed in Washington during the last few months as the result of the great expansion of governmental activities make it impossible to consider any longer holding the next annual convention in Washington. Philadelphia is near enough Washington to enable those engaged in working out the government program to come and join in the discussions. Hotel Adelphia will be the headquarters for the convention and all expecting to attend should make their reservations with the hotel as early as possible.

THE Vocational Educational Association of the Middle West will hold its fourth annual

convention on January 24, 25 and 26, at Chicago.

PRINCIPALS of seventy private schools in New England, New York, New Jersey and Pennsylvania joined in a conference at Worcester Academy, Worcester, Mass., on December 29, to discuss the relation of the schools to the government. One of the chief problems considered was maintaining efficient faculties, in view of the large number of teachers who have entered various branches of military service.

DR. GEORGE D. STRAYER, of the department of school administration, Teachers College, Columbia University, was the guest of honor of the Boston City Club on December 22. He spoke on "The Modern School." A round table discussion with questions followed the address. The newly elected officers of the club for the year 1917–1918 are: *President,* Payson Smith, commissioner of education of Massachusetts. *Vice-presidents,* Ulysses G. Wheeler of Newtonville, Jeremiah E. Burke of Dorchester, William E. Perry of Brookline. *Secretary-treasurer,* Leonard M. Patton of Milton.

A MEETING of the southern California branch of the National Council of Geography Teachers was held at the Los Angeles State Normal School on Saturday, November 24. Mr. James F. Chamberlain, head of the department of geography in the Los Angeles State Normal School, had charge of the meeting and was reelected as director of the southern California division. Miss Myrta L. McClellan was made secretary and treasurer. The speakers were Dr. Ernest C. Moore, president of the Los Angeles State Normal School, and Dr. Albert Shiels, superintendent of the Los Angeles City Schools. Dr. Moore's subject was "The place of geography in education." Dr. Shiels talked on "The teaching of geography in the elementary school."

MR. BERTRAND RUSSELL'S lectures on the "Philosophy of Mathematics," at Dr. Williams's Library, Gordon Square, London, have been so successful that a second course, to be given after Christmas, has now been arranged. The new course will be quite distinct, and, like the present, will be designed to expound the logical basis of mathematics. The lectures presuppose no special mathematical training, and technical terms and symbols are dispersed with. The present course, which concluded on December 18, has dealt with the more specially mathematical questions. The new course will be devoted to philosophical problems, and Mr. Russell will expound his theory of logical atomism. It will be remembered that Mr. Russell was dismissed from the lectureship he held at Cambridge owing to his opposition to war and was not permitted by the British government to fill his engagement to lecture at Harvard University.

AT the semi-annual meeting of the board of trustees of Goucher College, held on December 28, in response to a suggestion in the report of President Guth, definite action was taken for the purpose of leaving no doubt in the minds of any one as to the full and hearty support on the part of the college of the war measures of the government. While no reflection was made upon any of the officers or faculty of the college, the expression was freely made that no pro-German, pacifist, or neutral sentiment would be tolerated by the college. The following resolution was passed:

Voted, That no person whose unqualified loyalty to the government and whose thoroughgoing support of the participation of the United States in the war is, in the opinion of the executive committee, subject to any reasonable doubt, shall be continued or placed upon the salary list of the college; and that the president of the college is hereby instructed to send a copy of this resolution to every member of the faculty; and, further, that with the approval of the executive committee, he shall take such other action as may be necessary in the premises.

IN furtherance of the University of California's service to the public during the war, the board of administration of university extension of that institution has decided to enlarge the activities of the bureau of extension lectures and to emphasize courses of lectures concerning problems thrust upon the nation by the war. Dr. F. F. Nalder, who has for some time had charge of the university's correspondence instruction, has been appointed to take charge of the bureau of lectures. During

the war, stress will be laid on lectures that will educate the public of California on problems of public health, food and fuel conservation, finance, industrial efficiency, international relations, etc., that now confront the nation. Several competent lecturers have been engaged to devote their entire time to this service, and the resources of the university faculty in this respect will be drawn on as much as possible. Courses of university extension lectures have been arranged to be given shortly at Los Angeles and several other places in southern California, in the San Joaquin Valley and in the vicinity of San Francisco. One of the courses to be given consists of the following lectures by members of the university faculty: "Science and the war," Professor J. C. Merriam; "The relationship of Great Britain and the United States with respect to the Pacific," Professor Elwood Mead; "The common heritage of England and America," Professor Charles Mills Gayley; "Great Britain: a democratic commonwealth," Professor William MacDonald; "The relation of Latin America and the United States as affected by the war," Professor Herbert E. Bolton; "Lessons from British war finance," Professor Carl C. Plehn; "The course of empire," Professor Bernard Moses; and "Education and the war," Professor I. W. Howerth, director of university extension.

UNDER the auspices of the public service division of the State University of Montana, a series of lectures on the nations of the Great War is being given at the university and in various cities of the state, the proceeds from the lectures being devoted to the Red Cross. Each lecture is first given at the university and then in the following cities: Deer Lodge, Philipsburg, Butte, Anaconda and Dillon. The subjects of the lectures are as follows: (1) Germany, by the Honorable J. H. Durston, editor of the Butte *Post;* (2) Belgium, by President J. M. Hamilton, of Montana State College; (3) Russia, Dr. Louis Levine, University of Montana; (4) England, Reverend F. R. Bateman of Helena; (5) France, Professor Henry Haxo, University of Montana; (6) Turkey, Dr. J. H. Underwood, University of Montana; (7) Italy, Professor F. C. Scheuch, University of Montana; (8) Balkans, Dr. H. A. Trexler, University of Montana; (9) Scandinavia, Dr. N. J. Lennes, of the University of Montana.

THE *School Board Journal* states that the building of schools in Philadelphia has come to a standstill notwithstanding the number of pupils increases steadily and 20,000 are on part time. The condition is due to the high cost of materials. The number of pupils on part time in September was 18,957 as against 24,526 in October, 1916.

THE public-school system of Philadelphia faces a deficit of $362,781 during 1918–19. The estimated income is $11,714,051 and the estimated expenditures are $12,036,833. The school board has adopted a recommendation providing for a reduction in the size of the department of superintendence and a redistribution of the duties among a smaller number of men. The change is in the direction of war economy and provides for a reduction of the number of associate superintendents from six to five and the number of district superintendents from ten to eight. A saving of $11,700 is effected in the salaries of the three men, besides a saving in the force of clerks and assistants. Approximately $15,000 to $20,000 will be saved to the board through the reorganization plan.

BY a recent purchase from the estate of the late Professor Lucien A. Wait, Cornell University has acquired a strip of land some four hundred feet long on the north bank of Fall Creek between Prudence Risley Hall and the foot bridge back of Sibley College. The university now has title to the bank of the creek from the foot bridge east to the trolley bridge overlooking Triphammer Fall, and will by reason of this control be able to meet demands for the future expansion of the power plant.

A GIFT of £10,000 for the foundation of a chair of commerce at Liverpool University has been announced under the will of the late Mrs. Chaddock.

SENIORS at the University of Wisconsin who enlist or are drafted into the army or navy

during the current year will be granted their diplomas of graduation next June and other students who withdraw for military or naval service will receive college credit, in accordance with resolutions announced by the faculty.

NEW members of the faculty of the State University of Montana include Dr. George F. Lusky, University of Wisconsin, instructor in the department of Romance languages; Dr. J. W. Swain, formerly of Wabash College, instructor in the department of history; Dr. Helen S. Hughes, graduate school of University of Chicago, instructor in the department of English; Mr. R. F. Coleman, formerly of the faculty of Butte high school, instructor of English and in charge of the work in the public speaking department; Dr. I. R. Dyce, Kansas Agricultural College, assistant professor in biology; Professor Howard M. Jones, University of Texas, assistant professor in English; Miss Ina E. Gittings, University of Nebraska, director of physical education; George A. Denfeld, University of Wisconsin, instructor in department of business administration; Captain Swarthout, Montana National Guard, in charge of military education.

AT the one hundred and fifth convocation of the University of Chicago on December 18 there were one hundred and seventy-five candidates for titles, certificates and degrees. Of the total number of candidates, ninety received the title of associate and two the certificate of the College of Education. The total number receiving degrees in the colleges of arts, literature, science, commerce and administration and education was forty-five; in the law school, four; in the divinity school, thirteen, and in the graduate schools, twenty-one. The total number of degrees conferred was eighty-three. Two Chinese and three Japanese received higher degrees. On account of war conditions there was no convocation address, but President Harry Pratt Judson presented his usual convocation statement on the condition of the university.

IT is noted in *The American School* that with the new course of study in industrial work inaugurated by Superintendent Bush, of Erie, the high-school boys will spend approximately half of their time in the study of English, algebra and general science, and one half in drafting, practise shop and similar work. The summer following his first high-school year, the boy will work in one of the factories of Erie as a trial apprentice. At the beginning of the second year, he will alternate between the school and the shop. This system will continue through the remaining three years of his course. Before the beginning of each school year the boy, his parents, the employer and the school authorities agree upon the service, the wages and upon the opportunities of work to be given him during the year. Under this plan the student will work thirty weeks, and go to school twenty weeks each year. In order to give the boys some notion of the kind of work which they can best do, it is planned to have a range of fundamental wood-working, metal-working and electrical construction opportunities, as well as sheet-metal construction, printing, concrete construction and drafting practise, given to the boys in the upper grammar grades. It is noted that the manufacturers of the city are cooperating heartily in this plan.

AT a conference lately held in Cambridge between the principals and lecturers of Girton and Newnham Colleges and representatives of the Incorporated Association of Head Mistresses, a resolution was carried urging upon the board of education the extreme importance of recognizing English as one of the principal languages in an advanced course of modern studies in secondary schools.

DISCUSSION AND CORRESPONDENCE

SOCIAL ATTITUDE IN SCHOOLS

IF the subjects for teaching in the elementary schools are considered it will be realized that there is no stress placed on social studies as such. In fact there is no attention at all given to social attitude and the understanding of underlying facts of society and its history. As the grades progress to the high school, civics is added to history, and in the high school more history is added to the anatomy and physiology of government. Of elementary sociology adapted to the earlier years of a child,

broadly informing of the progress upward from pre-civilization, there is nothing. If the child gets any view at all it is a confusion of fairy-tales, United States history idealistic and patriotic, with a boresome account of how we are governed. Since the newer text-books have been making their way into some of the schools, there is growth in accuracy and interest, and a beginning of application of the facts to actual environment. The growth has not yet brought a sense of the need of broader and more fundamental synthesis of facts with analysis of the past.

It is widely unconsidered, this whole subject; and where it is thought of, the idea of adding another course to the unwieldy curriculum or of daring to burden the child mind with such a course is generally rejected without any waste of time. The reality of the need lies in the obviously undigested social material now taught, and in the general unawareness, whether by "practical men" or the public, of what we are educating for. If the newer ideals, reincarnated or otherwise, have basis that is to bring schools out of the wasting condition of mere economic training poorly applied, then it must be confessed that part of the fulfilling methods are to be founded on what Professor Gillette has said—

> Our psychology has been individualistic and our moral precepts and teaching have been in the direction of viewing the individual as a separate agent, alone accountable for his success and without obligation to the community which has really produced him. The cure for the bad conditions and the establishment of a better order of things must in large part proceed out of a better knowledge on the part of individuals of their place and function in society and of their duty to it. This knowledge can not be given in a year by way of precepts bearing on duty in the abstract, but must arise from a long inoculation through concrete teaching about social relations of the individual and institutions as they are found in action in the community about the youth.

Professor Gillette has been one of the few to vision this necessity, and several years ago in the *Journal of Sociology* his paper, "An Outline of Social Study for Elementary Schools," stated an approach which has been at least placed on the statute books of North Dakota for trial. A recent paper in SCHOOL AND SOCIETY by Professor Rapeer, "A Core Curriculum for High Schools," states an approach of similar social attitude toward the later grades and the high school. There is little real interest yet taken, however, and almost no trial in elementary schools of a plan for such social study. The very pith of the matter is the conviction that the perplexity and seeming inertia of American life may germinate in a lack of correlation and integration of these "contacts" upon which the newer education is based. The living of real life in the school is of the essence, but if there is to be added to the subjects taught something more than interest and adjustment, it is imperative that attitude as such be realized. Eliminating the excess of merely disciplinary studies, adding scientific and recreative stimuli, are perhaps the clearing of the clogged channels. There is also the more intensive imperative of opening up new channels, and making the opportunity of growth and adjustment to the environment a chance of deeper attainment of the attitude of understanding. This must come to mean awareness of the self and of the fellow, and it is only to be seeded in the growing child mind, not in the superimposing of precepts and dogmas upon this elementary adjustment and expediency. There must be an equal stress placed upon the attitude as upon the adjustment. There must be an equal emphasis upon the search and adventure for affirmative ends as much as upon the realistic trial-and-error method. Both are essential, but an attitude must be inculcated as much as the realization of the facts. Control of means for a given end rests, after all, on the potential capacity for knowing ends at all. The lack of imagination in realism is a danger. It is suggested then that the growing child shall begin his orientation and awareness of self, not by the present haphazard waste and laissez-faire method, nor by entire submission to the trial-and-error methods, but by a conscious planting of attitude as such, the understanding that is based on knowledge as a progressive process in the school, and that

proceeds year by year from an intelligent insight into past history critically examined and interpreted, into a natural cognizance of himself and his relations with his fellows. There is reason to doubt whether under present conditions any child can secure the broad and fundamental ideas which underlie community. Since community is the idea on which the fulfilment of the individual rests, on which, in fact, any happiness depends, it seems certain that no attitude could be expected if schools either answer the curiosity alone, answer the adjustment demand alone, answer the desire for adventure or search alone. There is a necessity for constructive implanting of facts interpreted in the light of a free mind, to the end that the individual shall come to awareness of himself in the realizing of the growth and errors of mankind and his dependence on and relation to his neighbor and the community.

History and civics as taught in the past, and even as now taught in the better schools, do not do this. There is no relation to the larger issues, there is no correlating of history and civics and a dozen other subjects which admit only of the highest intensity of realization if they are gathered together, already founded upon this social and sociological knowledge and insight. It must be simple and planned for the whole number of years which are demanded of the pupil. It has in it the seed which most of the other imposed subjects can not offer, whatever their economic and adjusting value. It is the true basis of the attitude which must inhere in the man if he shall come to the approximation of his possibilities, for it begins with facts and it grows into a way of looking at life that is the antidote perhaps for much of our waste and war and naïve hypocrisy. It is more significant in that it is the affirmative quality which is not now making all through the years of schooling in which the child becomes the man. We should not hesitate if we could see within ourselves and know our own motives and realities, but we fear the impractical. This is impractical in the extreme—it is the true practical, however, and self-consciousness is the end of education. Our self-consciousness is naïve and its sophistication material. Social knowledge and understanding offers a way to true awareness and control of the spiritual environment. We are well able to take care of the material environment through the scientific and newer ideals. It may be that the making of attitude should be added, and that in true social education lies one most valuable method.

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QUOTATIONS

SALARIES IN SCOTLAND

THE report of the departmental committee on the salaries of Scottish teachers marks an epoch. Whatever happens, the prospects of teaching in Scotland can never again fall back into the position which of late years they have occupied. The profession has been set upon a new basis and must henceforth be judged by new standards. Nor will the effects be confined to Scotland. They will be felt widely in England and beyond, and they will react to the benefit of Mr. Fisher's bill and policy. The report explains the principles that guided the committee and adds a scale of model salaries. Briefly, the limits range between £80 and £1,000, the former the initial salary for women assistants in all classes of school, the latter the maximum for headmasters and headmistresses of the highest class of secondary school. In the lowest grades men begin at £100; graduates if women at £90, if men at £120. The maxima are: For the lowest grade of assistant, woman £160, man £220; for first assistants in primary schools, £300, headmasters, £550; for first assistants in secondary schools, £450 or more, heads £1,000, both irrespective of sex. The differentiation of men and women is accentuated during the earlier years of service and tends to disappear later on. The prizes of the profession are open equally to the sexes, but competition between them will not arise here to any great extent, as the headships will be respectively of boys' and girls' schools. The committee is of opinion that the responsibilities for the sup-

port of a family entitle the man to some increase of remuneration; but, curiously, this proviso is not made applicable to the later years of his service, though the education and settlement of a family must often extend far into the father's active life. One would have desired to see the heads of important departments in the highest secondary schools put on at least an equality with the heads of primary schools; instead of £450 "or more," £500–£600 might well have been recommended. The disparity between these posts and the headships looks excessive, as it stands. The scales for heads of primary schools are subdivided into no fewer than seven classes according as attendance ranges from under 125 to upwards of 1,100. In large cities the lure of an extra £50 or £100 will draw the teacher from a somewhat smaller school where he is doing good work to a larger in a new district—a method that in practice proves very unsatisfactory. The seven classes might with great advantage be reduced to three or four. But on the whole the scheme is admirable.

Generous as the proposed scales are when compared with existing ones, they are only minimal, and will call for revision periodically if they are to answer their purpose. They are national, and are intended to apply equally all over the country. The committee foresees difficulties, which will undoubtedly occur, in the free transfer of teachers from one local authority to another. Some sacrifice will often be entailed when, from whatever cause, a man wishes to change his masters or his sphere of labor. The enlargement of areas, when it comes, will mitigate the hardships. Progressive increase is provided for by increments ranging from £5 to £25. They are referred to as yearly, but they are not quite automatic. No mention is made of efficiency bars, but an equivalent of a kind is contained in various reports upon which increases are to be contingent. If the increments are applied continuously from entry upon service, the maximum will in most cases be reached in about a dozen years. But much of the benefit will turn upon the method in which the details regarding increase are determined.

A very important consequence of the introduction of the new system may be expected to be the disappearance of bounties and other inducements to entrants to the profession. The prospective teacher is now offered a career. The best pupils of the secondary schools will find the new conditions attractive enough to give teaching an equal chance with the other professions; the ministry of the Church may be actually a sufferer from the competition. The promise of considerable changes in the existing regulations for training is inherent in the scheme. Sir Henry Craik is to be warmly congratulated on the success of his labors and on the great service he has rendered to education. He has secured virtual unanimity both among teachers and between them and local authorities as represented on the committee. Teachers are no less to be congratulated on this the first fruit of their union and of their programme of reform. It only remains for Parliament to pass the necessary legislation for the reconstruction of local administration and the consolidation of finances. We can not now go back; the first stage involves a second and as many subsequent ones as may be required.—London *Times Educational Supplement*.

THE RECRUDESCENCE OF APPRENTICESHIP IN WISCONSIN

THE recent development of apprenticeship in Wisconsin is in sharp contrast to the oft-repeated statement that "apprenticeship is dead." For the country as a whole, apprenticeship as an educational and industrial system has indubitably declined. The following table indicates this clearly:

Year	Number of Apprentices	Total Number in Manufacturing and Mining	Ratio
1860	55,326	1,850,034	1 to 33
1880	44,170	3,837,112	1 to 87
1890	82,057	5,091,293	1 to 62
1900	81,603	7,112,987	1 to 88
1910	118,964	11,623,605	1 to 98

Despite this general decline, the apprenticeship system in Wisconsin has, during the last

two years, shown unmistakable signs of growth. The industrial education law of 1911 began the regulation of apprenticeship by prescribing that every apprentice should receive not less than five hours a week of instruction in English, citizenship, business practise, physiology, hygiene, the use of safety devices, and such other branches as might be approved by the state board of industrial education. This law also provided for the registration of all apprenticeship indentures.

In 1915, the apprenticeship laws were amended so that they included: (1) Compulsory indenture. Every apprenticeship contract was to be made in writing and a copy filed with the state industrial commission. (2) Time for instruction in the continuation schools. A minimum of five hours a week was required to be devoted to instruction and the employers were required to pay the apprentice for this time. (3) Regulation of hours and wages. Every indenture was to state the number of hours to be spent in work. Not more than fifty-five hours a week (including instruction) was, however, permissible. Apprentices over eighteen years could work overtime not to exceed thirty hours a month and were to receive for this one and one half ordinary wage rates. (4) Specification of the particular processes that were to be taught the apprentice. The employer must state definitely what processes were to be taught the workmen and the approximate time to be spent on each. (5) Supervision and direction of the system by the state industrial commission. The commission was given the power to classify trade and industries; to construct and supervise the contracts, and to act as the mediator for differences between apprentices and employers.

The commission was wise enough to create a state apprenticeship board to administer the act composed of representatives of the employers, of the unions, and of the state continuation schools. Perhaps most important of all, was the appointment of a full-time supervisor of apprentices who was also to act as the secretary of the board.

The board has succeeded in enlisting the confidence and cooperation of both employers and employees. Its most important accomplishment has been the formation of proper standards of apprenticeship in different trades and industries. Under the old relation of apprenticeship, the duties of apprentice and master were loosely defined. With the coming of the machine era, it became impossible to determine what processes must be taught the apprentice and what might be omitted. The employers quite naturally took advantage of this confusion to confine apprentices to routine tasks and thus obviate the expense of giving them an all-round training. The clear definition of what is to be included under apprentice training removes much of this ambiguity and its attendant opportunities for abuse.

The board has also worked out a uniform indenture blank and has issued diplomas to boys who have successfully completed their apprenticeship. These measures help both by standardizing conditions and by offering an incentive for the apprentices to do their best and to complete their apprenticeship.

Statistics show that the results of this system have been most satisfactory. Under the law of 1911, the following number of apprentice contracts were entered into: 1912, 142; 1913, 260; 1914, 220, and 1915, 163. The 1915 law first became fully operative for the year 1916, and in that year a total number of 468 new contracts were filed. This was an increase over the previous year of approximately 200 per cent. and an increase of 80 per cent. over the highest mark in the four previous years.

The distribution, by trades and localities, of the total number of apprentices is very interesting. Five hundred and sixty-six, or 58 per cent., of the 969 apprentices registered at present, are in the machinist trade; 121, or an additional 12 per cent., are patternmakers. The number of apprentices in such trades as plumbing, boiler making, brewing, moulding, tool-making, carpentering, plastering and painting is very meager. Seven hundred and forty-four, or 77 per cent. of the total for the state, are concentrated in Milwaukee.

The modal wage-scale for the period of apprenticeship is as follows: For the first six months, 12 cents an hour; for the second six months, 13 cents; for the third half year, 14

cents; for the fourth half year, 15 cents; for the fifth, 16; for the sixth, 17; for the seventh, 18, and for the eighth, 20 cents.

Thirty-five per cent. of the apprentices were sixteen years of age when they began their contracts, 30 per cent. were seventeen years of age, 19 per cent. were eighteen years old and 10 per cent. nineteen years. Expressed cumulatively, 55 per cent. were less than eighteen and 74 per cent. were less than nineteen years of age.

This revival of apprenticeship in Wisconsin raises the interesting question as to how far apprenticeship can increase there and whether as great a growth could be expected elsewhere, should other states adopt similar systems. Apprenticeship in the United States declined because it was thought unprofitable by four parties: by employer, workman, parents and by the boy himself. The new Wisconsin system must remove these obstacles before it can become the chief method of trade instruction.

First, will it make apprenticeship profitable for the employer? The employer wants to produce as cheaply as possible; the apprentice to learn as much as possible. These two ideas are generally antagonistic. It is very costly for the manufacturer to move his apprentice about from process to process. It is cheaper to confine him to one particular operation. The growing specialization of labor makes this more and more possible. All-round training is not greatly needed. Only a small percentage of skilled workers are required in building machines or in using them. Machine-repairing, on the other hand, requires a large number of well-trained artisans and it is probable that it is in these trades that apprenticeship will find its chief development in the future.

Apprenticeship is moreover rendered still more unprofitable for the employer by the fact that once he has trained an apprentice, there is no guarantee that he can permanently enjoy his services. While learning, the apprentice is generally unprofitable. The only opportunity for the employer to recoup is to enjoy his increased productivity when the apprentice is once trained. When trained, however, other firms who did not go to the expense of teaching the apprentice themselves, can hire him away. They can offer higher wages than the first employer because they have invested nothing in the way of training. A premium is thereby placed upon not training apprentices. Firms rely upon "stealing" their skilled hands rather than training them. Though it may be for the interest of the industry as a whole to have a supply of well-trained apprentices, to the individual firm it generally spells a loss.

It is difficult to see how the Wisconsin method will obviate these difficulties.

Secondly, will it remove the dislike of the workman, already in the shop, for apprenticeship? The boy is his potential rival. He dislikes to show the apprentice the tricks of the trade. This opposition may be removed through the participation of the men in the fixation of apprentice standards, numbers and length of service. The burden of instruction may be shifted upon specialized foremen, as is being done in many plants.

Third, will it remove the indifference of parents? Since the apprentice is receiving education as a part of his wage, his initial money wage is less than that of his fellow in an unskilled position. Many parents are unable to look beyond this initial disadvantage. The popularization of the merits of the apprenticeship system will serve to lessen this short-sightedness.

Finally, will it make apprenticeship attractive to the boy himself? Vocational guidance will enable him to look beyond the small beginning wage. The definite specification of what shall be taught and the issuance of a certificate will make the child more anxious to become an apprentice than he has been in the past.

In short, to the extent that the decline of apprenticeship was due to faulty organization and to indifference, the Wisconsin system offers hope for a rehabilitation of the old system. To the extent, however, that the decline has been caused by the inevitable specialization of the machine era and by the individualistic conduct of industry, it presents no real remedy.

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SCHOOL MEDICAL SERVICE IN WAR TIME

FOR the first time the Educational Directory issued by the United States Bureau of Education last year contained the names of school medical officers in cities of 25,000 or more inhabitants. Plans are under way for an official publication under another authority, which will include a still wider range.

These are indications of an awakening interest in this branch of public service and of a recognition of the part it can come to take in education. The need of attention to this matter is becoming constantly more evident as the pressure of war conditions calls physicians and nurses away from the school work.

In the issue of SCHOOL AND SOCIETY for November 11, 1916, a statement was made of conditions in school medical service in England during the earlier war period. The report of the chief medical officer of England and Wales for 1916, recently issued, brings the story up to date. The war basis adopted in 1915 permits local authorities to discontinue the examination of all children except those who are reported as ailing. Nearly as many districts have availed themselves of this permission in 1916 as had done so in the year preceding and the total number of children examined has been reduced this past year by 28 per cent. The good effect of these losses has been an increased effort on the part of medical officers to interest principals and teachers in caring for the health of the pupils and several excellent handbooks have been prepared for this purpose.

Many of the vacancies caused by the removal of nearly 300 physicians from school to war service have not been filled. One hundred and sixty-three nurses have gone to the front, but their places have largely been taken by substitutes and the balance of responsibility in many situations has been transferred to the school nurse.

The lack of facilities with which to care for the physical defects already known is beginning to be felt in American cities. What will be our state when we have done as much as they have in sending medical men into the war zone?

Before the war a tendency had begun to appear in England, which discouraged the admission into elementary schools of children under five years of age. This new policy has been advanced by war economy and the number of these children under care has been reduced by half. In 58 areas the practise of exclusion has become practically universal.

School feeding on an extensive basis began in 1907 and from 1908 to 1912 amounted to about 16,000,000 meals served each year. In the latter year the coal strikes increased the number to 19,000,000 and in 1914–15 war conditions brought it up to 29,000,000, but increasing cost and the reduction of extreme destitution through more frequent employment encouraged one third of the local areas to cease serving meals and the number furnished last year is about one fifth of what it was two years ago. Even at the highest point the children cared for—195,000 a day—were less than a third of the number of malnourished children reported by the medical officers.

The average cost per meal was 1.22 pence in 1908–09—the increase was gradual up to 2.47 pence in 1914–15 but the last two years it has risen to 4.1 and 5.48 pence.

Such reports as are available on the results of medical inspection show slightly less percentages this year in malnutrition, inadequate clothing and uncleanliness, but each table from inspection to treatment shows the steadily decreasing service and justifies the statement of the chief medical officer that the work has been curtailed and injured, though it may be hoped not permanently, by the necessities of the national situation, and it has been brought to an irreducible minimum of catching the sick child and attempting to provide treatment. To do this is good, no doubt, but it is the enemy of the best. The best is to organize and maintain against all encroachments a complete and properly coordinated scheme of supervision of the physical condition of every child in the state and of the factors of environment bearing on his health and training. For the state has appointed itself the guardian of the child in the matter.

The control of juvenile employment is more

clearly related to the earlier life of children in England than it is with us. In general their child labor laws place at 12 what we place at 14. This section of the report is a very valuable presentation of present legislative control, evidence upon this subject presented by school medical officers and an interpretation of this evidence by the chief medical officers. Neither the evidence furnished nor the program demanded for immediate application justifies in any respect the attempts made in American legislatures to reduce the present legislation standards. The conclusion is:

> No child under 14 years of age should be exempted from education, half-time or whole-time, for purposes of employment for profit. . . . No child attending school shall be employed out of school hours except at prescribed hours and for prescribed periods . . . the employment of all young persons from fourteen to eighteen should come under medical supervision and control.

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EDUCATIONAL RESEARCH AND STATISTICS

THE SPELLING ABILITY OF UNIVERSITY STUDENTS

THE investigation discussed in this article was undertaken with the hope of gaining some information in regard to the following questions: Are university students poor spellers? What is the nature of their spelling errors? Does the marking of misspelled words in their papers result in any improvement in spelling? Is there any relation between spelling ability and general scholarship? Instead of using some of the recently devised scales for measuring spelling ability, useful as they are, it seemed desirable to make a somewhat more complete study of the questions, through an exhaustive examination of written exercises handed in by students. The real test of one's spelling ability is, after all, the facility with which one spells words correctly in written composition.

The material used consisted of the weekly papers prepared by members of two classes in the course in mental development in the University of Wisconsin during the school year 1915–16,[1] and the examination books of one of the classes.

The class during the first semester was composed of 86 women and 14 men, of whom 25 were seniors, 69 juniors and 6 sophomores. The collegiate distribution was: liberal arts 81, agriculture 4, home economics 14, music 1.

Each student submitted during the semester 18 papers, which averaged 884 words per paper, making an average of 15,912 words for each student. The number of words per paper was determined by counting those in five papers selected at random out of each one hundred. There were 57 papers which were handed in so late that they were not included, leaving the number of papers from the first class used in the study, 1,743. Thus the total number of words examined for errors in this class was approximately 1,540,000.

The total number of different words misspelled was 277, of which 28 were classified as slips of the pen. Of course, many words were misspelled over and over again during the semester, so that the total number of spelling errors was much greater than 277. A complete record of repetitions of mistakes was not kept for this class. The average length of the misspelled words was eight letters. There were 15 students who made no mistakes in spelling, while 18 others misspelled only one word each. The largest number of different words misspelled by a single individual was 49. The most frequently misspelled words were: develop, development, perform, principle, affects, lose, analyze, too and occurrence (or occurred). It must be admitted that in looking over so much material, a few errors are certain to be overlooked. However, since practically all the papers were read by two readers, the number which would thus be overlooked would not be large.

There were 96 students present for the final examination and they wrote approximately 160,000 words, an average of 1,667 words for

[1] The course was given by Professor M. V. O'Shea with the writer as assistant.

each person. The total number of different words found misspelled in these books was 256, while the total errors amounted to 505 words, or an average of 5.2 per student. Of the 256 words misspelled, 55, or 21.55 per cent., were judged to be slips of the pen. The average length of the words missed in the examination books was 7.7 letters. No errors were found in the books of 23 individuals and five other books yielded only one error each, all of which were slips. On the other hand, one man failed on 33 different words with a total of 36 errors, in writing 1,300 words, while a young lady succeeded in making 33 spelling errors in writing 1,050 words. The average rate of error for the class in the examination was one word misspelled for every 317 written. The most frequently misspelled words in this list were: affects (missed by 14 different persons), develop, lose, too, impulsively, breathe, laboratory, perform and principle.

It might seem that, since the written matter was confined to the subject of mental development, the range of words used would be small and, hence, the spelling errors limited both as to number and range. This is true only in a small degree, for the problems assigned for written work are of such a nature that they lead the student to call constantly upon a variety of past experience for concrete illustration of principles involved.

The second class whose composition was examined for errors consisted of 96 students of about the same classification as the first. The record for this class covers only the first nine weeks of the second semester, during which time 820 papers were submitted. The papers were much shorter than those of the first group, averaging only 425 words. The total number of different words misspelled in this material was 336, and counting the repetitions of errors the number of errors was raised to 631. Only 26 of these words could be called slips. In this class, then, the average number of words written per student was 3,630 and the average number of errors 6.6. The average word length of misspellings was 7.5 letters. At the end of the nine weeks' period there were only six students with clear records and seven others with one error each. One man in this group made a record of 52 spelling errors in writing 3,600 words. The most frequently misspelled words here were: develop, development, occurred, principal, suppress, too, arithmetic, lose, perform, believe, imitate, knowledge, immediately, possess, principle, there and than. Each of these words was misspelled by four or more persons.

From the data presented above it is obvious that the spelling ability of the first class was considerably above that of the second. As a matter of fact, the first class was superior in all lines of work. Of the 277 words misspelled by this group, 141 were charged to six students while the composition of 33 members contained practically no errors. In the examination books, 134, or over half, of the 256 words incorrectly spelled were charged to seven persons. The books of 51 students showed two or less errors each. In the second group 28 students made two or less errors in their daily work in writing 3,600 words each, while eight were charged with 211 errors, an average of over 26 each. If it be granted that these two groups of students are fairly representative, it is safe to conclude that, although the two classes differ somewhat in spelling ability, a substantial percentage of college students are entirely above criticism with respect to spelling. On the other hand we do find a few students in each group whose spelling is so atrocious that the advisability of their presence in an institution of higher learning, and especially in teachers' training courses, is exceedingly doubtful.

The question, does the marking of misspellings in students' written work result in any improvement in spelling, may be best answered by comparing the number of errors made during the different months throughout the semester. The errors by months were as follows: October, 71; November, 72; December, 58; January, 76. In this class no special effort was made to induce students to pay particular attention to their spelling; the misspelled words were always conspicuously marked, but no penalty was attached to the mistake. Obviously, then, the effect of calling students' attention to their spelling errors in this manner is negligible. Another investi-

gation which the writer is just completing entirely confirms this conclusion. From numerous conferences with students in regard to this matter it seems that there are a few who do take these marks on their papers seriously, but they are nearly always those who make few mistakes.

In order to determine the relation between general scholarship and spelling ability the average of the grades of each student in all the courses which he had pursued in the university was taken as the index of his scholarship. Only the first class was used for this purpose, since the data for the second were not so complete. Of this class 29 had entered the university so recently that no grades appeared on the records for them. The following table shows in a general way the correlation between scholarship and spelling ability as displayed both in daily work and in the examination:

Scholarship	Cases	Average No. of Words Misspelled	
		Daily Work	Examination
90 per cent. or above	10	1.2	2.4
80 per cent. to 89 per cent.	50	3.9	3.6
79 per cent. or below	11	5.7	7.3

It is clear that we have here a very substantial correlation. In further explanation it should be said that a few very good spellers are found in the group of poorest students, but no poor speller is found in the group with average scholarship of 90 per cent. or above. Nervous tension and haste, without doubt, very largely account for the greater proportion of misspellings in the examination than in the daily work.

There seem to be two distinct classes of sources or causes of errors in spelling in students' written work: (1) Conditions under which the student works, such as fatigue, nervous tension and haste. (2) Inability of student to spell words correctly, due to inadequate training. Most students, when reproved for bad spelling, reply that they have to write so rapidly in taking notes and in examinations that they can pay but little attention to the mere spelling of words properly. It is quite certain that practically all the mistakes due to slips of the pen are accounted for by the first class of causes. Of the 505 errors found in the examination books, 354, or over 70 per cent., were found in the second halves of the books, that is, each student on the average made more than twice as many errors in spelling, while writing the last half of his examination, as he did in writing the first. It is also to be noted that in the examination the proportion of slip errors was 21.5 per cent., whereas in the daily work it was less than 10 per cent. While in some college classes there may be much more nervous strain and stress than is conducive to the best results, most persons continually work under a certain amount of nervous tension and the only safeguard against spelling errors in college work is to have such training in the elementary schools that the correct spelling of all words necessary for ordinary writing has become entirely automatic. After exclud-

Type of Error	Example	Percentage
Double letters	Really (realy), equipped (equiped)	20
Slips	Remember (rember), refreshed (refresed)	12.3
Obscure vowels	Laboratory (labratory), signature (signiture)	12
Phonetic similarity of part of a word to a separate word	Kindergarten (kindergarden), fulfill (fullfil)	10
Confusion of consonants having same sound	Hence (hense), exercise (exerize)	7
Confusion of words identical or very similar in sound.	Course (coarse), lose (loose)	5
Omission of silent letters	Crudely (crudly), guide (guid)	5
Insertion of silent letters	Among (amoung), says (sayes)	4
Inversion of letters	Perform (preform), larynx (larnyx)	3
Substitution of ei for ie and vice versa	Receive (recieve), relief (releif)	3
Confusion of final y, ie, ey and i	Vary (varey), tries (trys)	3
Sh sound combinations	Direction (direcshion), sufficient (sufficent)	2.5

ing duplicates from the three lists of words there were found to be 729 different words which had been misspelled by the 196 students in written work. The following classification of prominent sources of error has been worked out to indicate what kinds of errors cause the student most trouble.

It is not probable that the students of the University of Wisconsin are worse offenders in the matter of spelling than are students of similar institutions. In one of his classes at Yale Professor Bailey found that students averaged a trifle over 2.3 errors to every 1,000 words of written matter. The written material consisted of essays prepared at home and would, therefore, be comparable to the weekly papers discussed in this article. In our second class where a complete record was kept we find that the rate of error was approximately 1.9 per 1,000 words. One of Professor Bailey's students was charged with a total of 45 words, while one of ours mutilated 52 words in writing slightly more composition. It is such spellers as these that cause a large part of the complaint about college students' spelling.

Somewhere along the line, or perhaps all along the line, many students have acquired the feeling that spelling is an entirely insignificant matter. It is not unlikely that some teachers in the public schools and especially in the high schools encourage pupils in underestimating the value of correct spelling in their written work by accepting manuscripts containing spelling errors. It is absolutely certain that until every teacher requiring any written work whatsoever of the pupil demands that such work be altogether free from errors we shall have students, graduates of the high schools, who can never escape the handicap of being poor spellers. The English teacher alone can do but little.

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SOCIETIES AND MEETINGS

THE MORGAN COLLEGE SEMICENTENNIAL

THE HON. EMERSON C. HARRINGTON, governor of Maryland, recently spoke in Baltimore encouraging words on Negro education at one of the public meetings which was held to commemorate the fiftieth anniversary of the chartering of Morgan College, of which Dr. John O. Spencer has been the president for fifteen years and Dr. William Pickens, well-known graduate of Talladega and Yale, is the dean.

Governor Harrington declared (1) that the progress of the Negro during the past fifty-odd years of his freedom justifies the provision which has been made for his education and the efforts that have been put forth by his friends; (2) that the education furnished by Morgan College, founded under the patronage of the Baltimore, Washington, Wilmington, and Delaware Conferences of the Methodist Episcopal Church, has had a wholesome effect on colored people; (3) that the Negro did not oppose or threaten his country under the stress of war; (4) that the Negro soldier would "go over the top" in this war as he did during the Spanish-American War; and (5) that the thinking white people everywhere wish to have the Negro own his home, live under sanitary and moral conditions, cut down his death rate, and secure more enlightenment.

Dr. P. P. Claxton, U. S. Commissioner of Education, referred to the South's new and more liberal interest in Negro education. He made a strong plea for giving Negroes all grades of education—elementary, secondary, and higher—to meet the present-day demands.

The Rev. Dr. John Franklin Goucher, president emeritus of Goucher College and well-known author, who is president of the Morgan College board of trustees, delivered a historical address. "The spirit burned in a few individuals fifty years ago, to seek out young colored men and give them the broader training, outlook and experience which were needed to carry the Christian gospel to the masses of their people," said Dr. Goucher. He explained that the Centenary Biblical Institute was organized as the first theological school for Negroes in America.

In 1866 the Methodists of several Conferences set aside $5,000 of their centennial

offering for the new work of training Negro ministers. The "infancy" of Morgan College, or what was then known as Centenary Biblical Institute, extended from 1867 to 1872, when the board of trustees bought some property for school purposes in Baltimore.

The period from 1872 to 1892 Dr. Goucher characterized as the "childhood" of Morgan. In 1872 the first class of two members was graduated. In 1886 Princess Anne Academy (Eastern Branch of the Maryland State College of Agriculture) was opened. This school is under the direction of the Morgan College trustees. In 1892 Morgan broadened its scope and was put on the college grade.

The "youth" of the college began in 1892. Since then, under Dr. John O. Spencer, the college has made steady, unobtrusive development. Morgan has had an infancy of five years; a childhood of eighteen to twenty years, and a youth of about twenty-seven years. When the Ivy Mill property, which is the recently secured site of Morgan College, has been developed, this most useful colored school, according to Dr. Goucher, will have fully completed its youth.

Some 5,000 colored students have received, in the aggregate, 12,000 years of instruction; some 940 of its students have engaged in teaching; 165 in the work of the ministry; 25 in medicine; 15 in law. About 23 per cent. have entered the professions.

According to Dr. Goucher, it is important to consider what would have been the effect upon the Negroes of America if Morgan College had not ministered to the 5,000 colored students; had not trained teachers, ministers, and others to use their knowledge for the uplift of their people; had not given men and women the opportunity of broadening their vision and filling their minds with knowledge of the race's needs.

The graduates and former students of Morgan have been self-respecting, self-supporting, and worthy of the respect of others. They have indeed been an asset to their community.

During fifty years Morgan College has expended $902,000. Of this amount $184,000 have been spent in buildings and equipment. The rest has been spent for maintenance. There is to-day a debt of only $23,000, which is about 3 per cent. of the total expenditure. In addition to the $900,000 about $750,000 have been contributed and spent by the students for their board. From the sweat and toil of the people to whom the school has ministered, there has come a large share of this $1,500,000 spent by Morgan College.

"Morgan College will step out into early manhood with assets of about $450,000," declared Dr. Goucher.

President Spencer conferred honorary degrees upon prominent Morgan alumni. A partial list follows:

Dr. Wm. A. Warfield, surgeon-in-chief, Freedman's Hospital, Washington, D. C., received a D.Sc.;

Joseph H. Lockeman, principal Baltimore Colored Normal School, D.Ped.;

Wm. Henry Brooks, chaplain "Fifteenth New York Regiment," D.D.;

Matthew Wesley Clair, pastor of Asbury M. E. Church, Washington, D. C., D.D.;

Wm. A. C. Hughes, field agent, Board of Home Missions and Church Extension, Methodist Episcopal Church, D.D.;

James U. King, pastor Zion M. E. Church, Wilmington, Del., D.D.;

McHenry J. Naylor, pastor Sharp Street Memorial M. E. Church, Baltimore, D.D.

President Spencer declared that the graduates of Morgan must live up to the traditions of the college by paying their debt for education through "most exalted service—service which may often be unmarked and unheralded."

Other speakers during the two-day celebration included Rt. Rev. Bishop Joseph F. Berry; Rt. Rev. Bishop Wm. Frazier McDowell; Dr. M. Bates Stephens, superintendent of public instruction for Maryland; and representatives from leading colored schools and colleges.

The Morgan College glee club brought to the semicentennial celebration the story of Negro struggle and hope through the excellent singing of such well-known "spirituals," or religious folk songs, as "Come out the wilderness," "I'm so glad I've been born again," "Look away to de Heaven," and "Lord, I want to be a Christian in my heart."

Wm. Anthony Aery